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Estelle Ducom. Fringe-belt analysis in France :A Conzenian approach to urban renewal. 2008. halshs-00203109

HAL Id: halshs-00203109

<https://shs.hal.science/halshs-00203109>

Preprint submitted on 9 Jan 2008

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Environment and Planning b: Planning and Design

**Fringe-belt analysis in France :
A Conzenian approach to urban renewal**

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Fringe-belt analysis in France :

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Abstract :

This study is based on the fringe-belt model, tested on Nantes and Rennes (France). The model stresses the alternance of high and low density zones (fringe belts). Formerly at the edge of the built-up area, they are now embedded within it. Their formation and evolution are analysed. This model is used with GIS and considered in relation to the recent French law on Urban Solidarity and Redevelopment which encourages compact city policies, calling low-density fringe belts areas into question. The evaluation of the model could shed new light on the French decision making in urban planning, in relation to urban renewal (*renouvellement urbain*).

Introduction

In the contemporary context of globalisation, the internal structure of cities is changing. This paper brings to the fore the current issue of densification versus urban spreading. It is aimed at understanding the processes of urban change at the intra-urban scale from a morphological point of view, and proposes a new method of monitoring future urban forms.

Urban morphology has been neglected by the French *nouvelle géographie*, having been adjudged too traditional and empirical. This reflects, in part at least, a lack of awareness amongst French researchers of the theoretical dimensions of urban morphology that have been developed in other countries. A notable instance of this is the fringe-belt concept, which has been little explored in France. This concept has theoretical – including deductive – dimensions that could help to revive urban morphology within francophone geography. It could also be used as an interesting and relevant planning tool, in relation to urban renewal.

This article is in three parts. First, the fringe-belt model is briefly presented. Secondly, an application of the model to Nantes and Rennes, two French cities, is described: this illustrates the pertinence of the model and how it aids understanding the complexity of urban dynamics. Finally, the model is viewed in relation to the issue of the *renouvellement urbain* in France.

The fringe-belt model

The original *Stadtrandzonen* concept developed by the German geographer H.Louis in his study of Berlin (Louis, 1936) was refined by M.R.G. Conzen in his analysis of Alnwick (Conzen 1960). J.W.R. Whitehand made his theoretical contribution to this concept by integrating it with more formal economical thinking (Whitehand 1972).

Origins

The model is predicated on the idea that the city as a physical entity has been created by a series of growth pulses or alternating periods of rapid and slow growth. As a result, one can observe the presence of distinctive regions, originally at the edge of the urban area, but subsequently embedded within it. Conzen defined a fringe belt as “a belt-like zone originating from the temporarily stationary or very slowly advancing fringe of a town and composed of a characteristic mixture of land-use units initially seeking a peripheral location” (Conzen 1960). Fringe belts embedded within the urban area remain for very long periods as residual features in the urban landscape.

Theoretical developments

The fringe-belt concept was linked to land-rent theories by Whitehand who related the creation of fringe belts to slumps in residential building and periods of low land values (Whitehand 1972), as shown on figure 1.

Figure 1: Hypothetical relationships between bid rent and distance from the edge of the built-up area

It has been shown that these dynamics, combined with geographical obstacles such as topographical barriers and constraints in urban growth, generate an urban area in which compact residential growth zones alternate with more loosely-structured fringe belts. Institutions such as hospitals, universities, parks, cemeteries, jails, military barracks and large houses isolated on large plots are typical of the type of land uses that locate at the urban fringe during periods of slow urban growth. When urban growth resumes, a permanent mark is left in that the fringe belt becomes embedded in the urban area. This model “provides a means of putting order into the otherwise bewildering complexity of urban morphology” (Whitehand, 1967). It

clarifies the processes of transformation from rural to urban land and the processes by which urban fringes and suburban residential areas develop over time.

An application to Nantes and Rennes

The pertinence of the model has become evident in researches on French cities (Ducom 2003, 2004, 2005).

Fringe-belt recognition

Using *Arcgis*, a Geographical Information system, it was possible to clarify the presence of several fringe belts in each city, characterised by their mean plot size, mean percentage of building coverage and mean building size. Thanks to this tool, a systematic locating of regularities and irregularities in the plots distribution has been possible. Three fringe belts were delimited in Nantes (figure 2) and three in Rennes (figure 3). Constructing maps through this automatic methodology implied to choose thresholds for the different illustrated parameters. Therefore, we realised that changing these limits made the illustrated belts more or less visible. It stresses the constructed side of this form. Carrying this reflexion even further, could it be possible that this concept even result of the geographer imagination, as a way to read the urban fabric? The use of GIS contributes, in a way, to the meta-understanding of urban forms.

Figure 2: The fringe-belts of Nantes, 2005.

Figure 3: The fringe-belts of Rennes, 2005.

Table 1 sums up the main physical characteristics of each fringe-belt. It is obvious that they considerably differ from neighbouring housing zones. Put simply, fringe-belts contain a high proportion of open spaces, large plots and large building of

highly varied types. Those characteristics also differ from one fringe belt to another. There seems to be a land pressure gradient from the city center to the peripheral area. Inner fringe belts have smaller plots with a higher building coverage, mostly public institutions or educational institutions. There is a big contrast between the middle fringe-belts in the two cities, corresponding to the differences of the cities' functions as the belt developed. Thus, whereas the nineteenth century fringe-belt of Rennes is mostly composed of schools, military barracks and jails, large houses, hospitals, sportyards, parks and railway stations, the nineteenth century fringe-belt of Nantes is occupied by similarly heterogeneous land uses but these include many industrial sites. The outer fringe-belts are characterised by their great proportion of sports grounds, allotments, green open spaces and large proportion of entirely vegetated plots.

Table 1: Physical characteristics of fringe-belts

Conditions of creation

The presence of a fixation line is a factor in fringe-belt development: any linear feature (such as town walls, topographical features, rivers, railways, boulevards, ring roads and green belt) restricts outward growth and is likely to be conducive in fringe-belt formation. Eighteenth-century maps reveal the burgeoning of institutions outside the town walls. Most of them are religious, but there are also a few health and military institutions. These zones form today's inner fringe belts. The middle fringe-belts mostly developed along the new railways and outside the boulevards. Rennes has a very obvious outer fringe belt corresponding to a successful green belt policy associated with the presence of a ring road (constructed between 1968 and 1995). It strongly influenced the formation of a fringe belt at the current edge of the urban area, which forms a barrier containing the outward growth of the agglomeration.

There is not such a clear outer fringe belt in Nantes, whose suburbs spread without any morphological rupture.

In accord to Whitehand's model relating the creation of fringe-belts to slumps in residential building and periods of low land values, the building cycles of each city were reconstructed. A variety of sources of information provided the bases for this. There were statistics stemming from the different censuses (municipal censuses from 1822 to 1930 and INSEE censuses from 1946 to 1999), the number of authorised and built houses and flats during the last 25 years obtained from the *Direction régionale de l'équipement* and statistics concerning the year of construction of houses and flats, which must be specified by the owners when paying the land tax. There was a major hiatus in house and flat building in the second half of the nineteenth century and again at the very beginning of the twentieth century. The last two periods of very low residential building activity were during the Second World War and between 1975 and 1990. Old maps of the cities indicate that those building slumps periods seem to be those of the creation of inner fringe belts, which had begun to form well before the nineteenth century, and middle fringe-belts, which correspond to Edwardian fringe belts in the English-speaking world (Whitehand, 1987). There seem to be a clear link between slumps in residential building and the formation of fringe belts.

However, this link has not been clearly evident since the Second World War. Whereas the inner and middle fringe belts were obviously to a considerable extent the product of economic factors, the outer fringe belts seem to have been strongly influenced by green belt policies from about 1960. This brings to the fore the question of the validity of a building cycle model in a current context of strong public planning, since land occupation is now decided more by the public authorities and less by spontaneous economic processes than during most periods in the past.

Until the beginning of the twentieth century, urban areas were very limited in extent. Urban growth was mostly the result of individual initiatives. Today, public authorities exercise significant control over the land market, which complicates the economic part of the model's mechanism. The model nevertheless provides an important aid to comprehension of the cities's long-term evolution.

Fringe-belts modifications

How can we explain that some parts of the belts have survived whereas others have been alienated? It brings to the fore the question of time in urban processes. From heritage preoccupations to speculative visions, the relations between urban development and multiple durations are complex. Two cases of evolution will be examined in Rennes. figure 4 illustrates the case of an alienated part of the nineteenth-century fringe-belt. The aerial photo taken in 1885 from an airship at a height of 800 meters shows Rennes's railway, in thick white dotted line. The city has not yet grown beyond the railway to the south, and all that can be noticed is the jail, boxed in a white dotted line, and a manor called Villeneuve, boxed in black dotted line. The Sacré Coeur church illustrated in figure 4 second picture was built from 1908 to 1911, in the fringe belt, preparing the development of the city to the south. At this time, it was quite isolated. Today it is embedded in a residential area, as shown on the third picture of figure 4, taken in 2002. In the background, boxed in a black dotted line, the steeple of the church rises up, surrounded by a great number of houses. Such stone-built houses with three floors are fairly representative of the 1920s and 1930s. In this example, the fringe belt was alienated by residential growth. Figure 5 represents the chronology of the process. The fourth document of figure 4, a density map from 2002, shows the process of densification that took place in this

area, where the nineteenth-century fringe-belt has been reduced to a few residual features within the urban landscape.

In contrast, figure 6 illustrates the case of fringe-belt consolidation. Its first picture was taken in 1885 from an airship at a height of 800 meters. The hospital Pontchaillou (boxed in black dotted line) was just a farm, the “Boulevard de l’Ouest” (here in white), now within the city and named Boulevard de Verdun, was in the country, like the railway. There was a military barrack (caserne Mac Mahon), which still exists, and a villa. As illustrated in the second picture, in 1900, the military barrack, boxed in white, and the first construction of the hospital Pontchaillou, boxed in black dotted line, are obviously visible, in the middle of an emerging fringe belt. Those huge plots have remained and are still visible in the area in 2000 (third picture). The fourth document of figure 6 illustrates that high density urban extensions have develop beyond this area, leapfrogging the fringe belt. It would appear, then, that in this area, the fringe belt has remained and even enlarged, due to a process of attraction: as the fringe belt had developed, the probability of same extensions was weighted according to the existing locational pattern. Thus, the hospital was enlarged and sports grounds and a campus were laid out.

Figure 4: Alienated fringe belt, south Rennes

Figure 5: Evolution of new urban developments in south Rennes

Figure 6: Partly remaining fringe belt, west Rennes

Last but not least, to an epistemological point of view, this research illustrates the evolution of a too long neglected field. The fringe belt model is included into a movement of new attention to urban forms. The morphological analysis has evolved. Traditionnally based on inductive, idiographic and descriptive methods, it has become dynamic, explanative, nomothetical, theoretical, deductive. Urban morphology

consists in giving forms to hardly visible structures which are still relevant in terms of conception and planning.

Application of the model in planning

Through fringe-belts are integrated to the historico-geographical development of cities, they are in fact rarely taken in account as entities by planners (Whitehand, Morton, 2003, 2004). However, in the current French context of *Renouvellement urbain*, the model could shed new light on urban planning.

The law on Urban Solidarity and Redevelopment

In France, the recent law on Urban Solidarity and Redevelopment (August 2000) encourages compact city policies. The law is aimed at restricting urban sprawl which contributes to environmental degradation and leads to population depletion in central or peri-central areas. It favours reasoned interventions in the existing urban space. Put simply, it is a matter of reconstructing the city on the city rather than allowing it to spread indefinitely. But the conditions necessary for urban recycling are not the same as those necessary for peripheral extension. Thus, the feasibility of urban renewal obviously depends on public interventions. In this light, it is important to utilize tools of recognition, identification and comprehension of forms with urban potential on the one hand, and tools of planning and prescription on the other hand. Fringe-belts are areas of high urban potential. They can be perceived as marginal areas to a land use and morphological point of view, and central areas to a prospective urban planning point of view, because they contain important land stocks. In the light of *renouvellement urbain*, the alternative of conservation versus densification is a burning issue. This fringe-belt research has a double justification. First, from a theoretical and cognitive perspective, it provides a way to conceptualize and analyse urban dynamics. Secondly, from a planning perspective, it is an aid to

understanding the future possibilities of urban forms based on their previous development.

Within the framework of French urban regeneration and renewal (Chaline 2005), one of the keys issues of urban planning is the question of densification of certain parts of the cities, calling low-density fringe-belts into question. The strongest pressure for change and intensification concerns the surviving inner and medium fringe belts. For instance, the project of the Island of Nantes concerns 350 hectares in the middle fringe-belt of the city (figure 7). This area has become deeply rooted in mental maps and is significant for the city's image, making the revitalisation programme polemical (Calvet 2005). In Rennes, a shopping centre has been planned on a 3000 m² area, La Visitation, situated in the inner fringe belt and corresponding to an ancient convent (figure 9).

But fringe-belts are not taken in account as entities by French planners any more than they are by British planners. Site-by-site decision making essentially depends on land availabilities. Members of Nantes and Rennes planning office and planning agencies (the AUDIAR, *Agence d'Urbanisme et de développement Intercommunal de l'Agglomération Rennaise*, and the AURAN, *Agence d'Urbanisme de l'Agglomération Nantaise*) were interviewed. None of them was aware of the fringe-belts model and of the fringe belts resulting from the complex historical development of the city as a whole. For most of them, the model was a good explanation tool, but hard to take account of in decision making. The gulf lying between fundamental research and planning practice was evident. In France, as in England, "The fringe belts concept, like many other concepts about the structure of cities, has been used almost entirely for explanatory rather than prescriptive purposes (...) Neither the decision making of those influencing fringe belts plots nor the significance of fringe

belts for planning have received much attention”. (Whitehand, Morton, 2004). Nevertheless, the comparison between the fringe belts maps and the maps of public interventions areas (*Zones d’Aménagement Concertées*) is striking, as is illustrated in the case of Rennes (figure 9). Most of the urban renewal operations that are undertaken are situated within fringe belts. Moreover, in the case of Rennes, the voluntarist policy of keeping a green belt despite the demand for building land underlines that the current outer fringe belt, which can be mostly assimilated to the green belt, is planned by the public authorities who paradoxically are not conscious of the fringe-belt concept. It is obvious that the evaluation of the fringe-belt model as a tool for understanding urban form dynamics could help planners in their practise and decision making.

Figure 7: brownfield land on the Island of Nantes

Figure 8: La visitation (inner fringe belt, Rennes)

Figure 9: Rennes: “Zones d’Aménagement concertées” in 2004.

Conclusion

The fringe-belt model aids understanding the complexity of urban dynamics. It should encourage planners to take fringe-belts in account as entities, instead of adopting case by case methods. Using this way of thinking about the city, it is possible to elaborate different planning strategies, according to the value and transformation assigned to each belt. If fringe belts are considered as simple land stocks, then, a strategy of densification and alienation will be followed, keeping in mind the special features of the area. But if fringe belts are considered as important heritage, then a strategy of conservation can be adopted.

The morphogenetic study of forms seems essential for their comprehension. The tool of the fringe-belt model underlines processes of stability and rupture, urban cohesion

and extensions. Thus, it could shed new light on decision making, urban prospective and establishment of urban projects that make sense. Like other morphological approaches, it does not simply offers transposable planning models, but it can be helpful to improve decision making.

Acknowledgements

This research would not have been possible without the help of Ms. Porpé, Ms. Tamoudi, (City of Rennes, cartography), Mr. Gauton (*Direction Régionale des impôts*, Rennes), Ms. Perron, (City of Nantes, cartography), Mr. Béquaut, (*Direction Régionale des impôts*, Nantes).

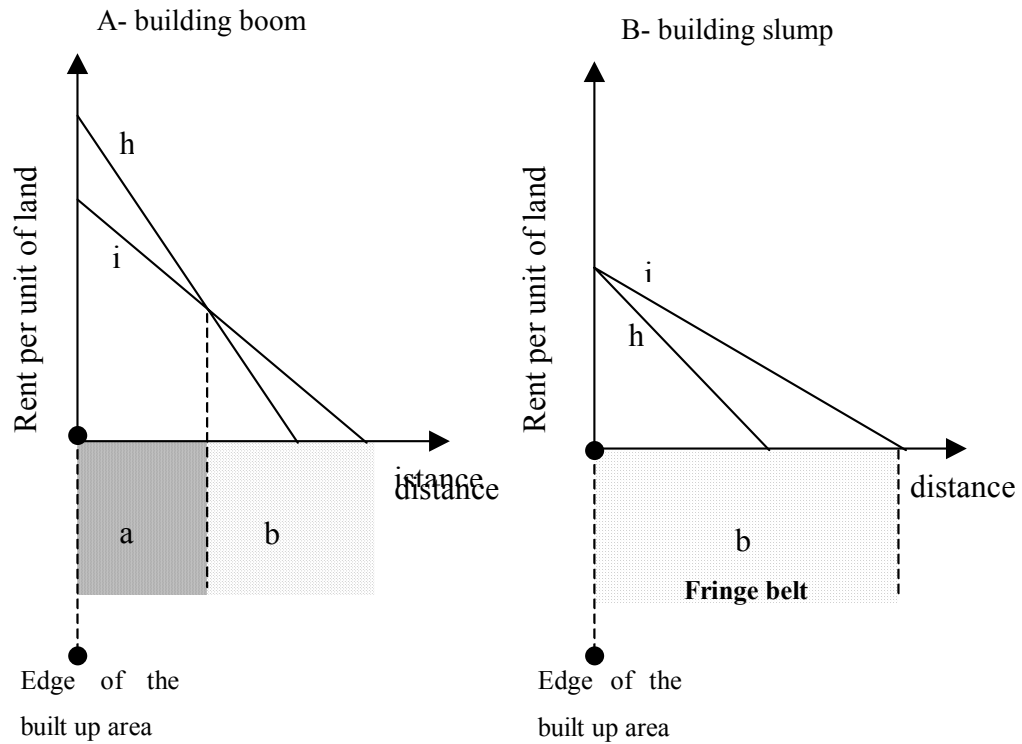
The author gratefully acknowledges fruitful discussions with Prof. Guy Baudelle (University of Rennes), Prof. Jeremy Whitehand (University of Birmingham), Prof. Bernardo Secchi (School of architecture of Venice) and Prof. Mickaël Darin (School of architecture of Versailles).

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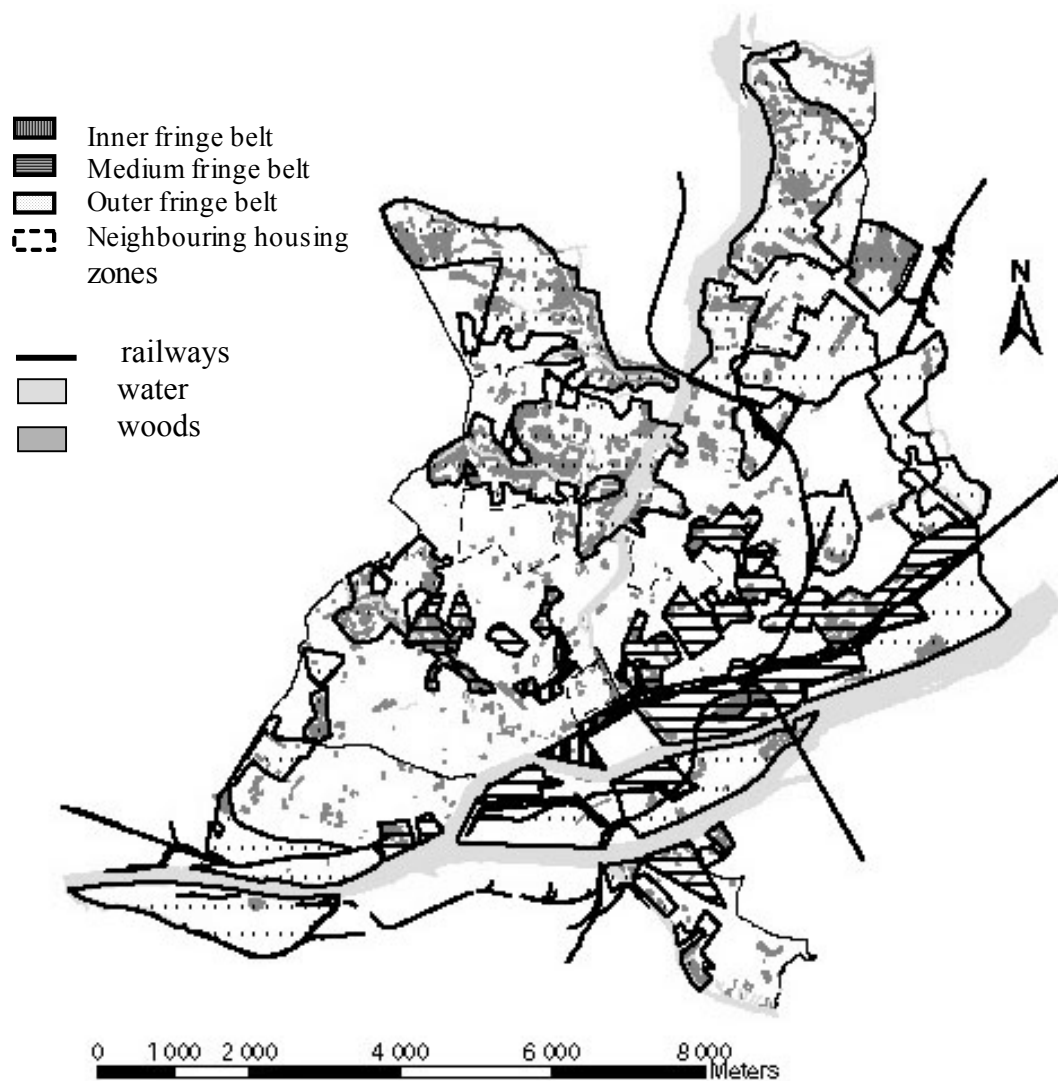
Figure 1: Hypothetical relationships between bid rent and distance from the edge of the built-up area



h : housing development
 i : institutionnal development
 a: intensive land-use
 b: extensive land-use

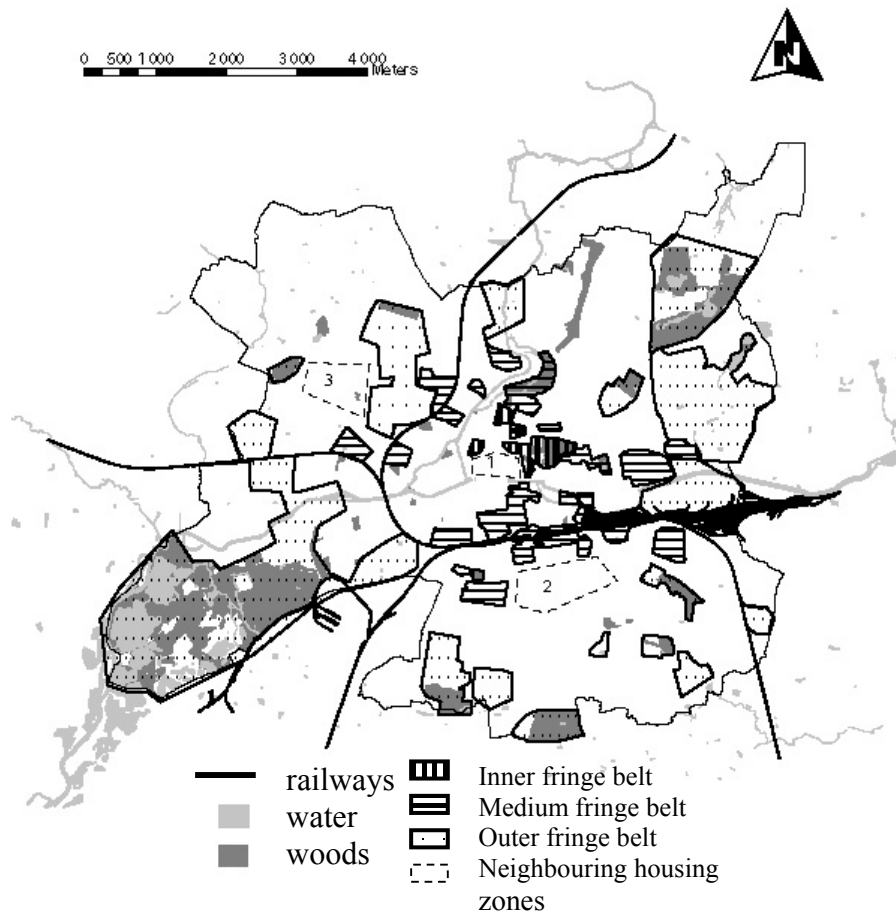
Source: Conception: author, after Whitehand, 1987.

Figure 2: The fringe belts of Nantes, 2005.



Source : Nantes city GIS data. Conception: author.

Figure 3: The fringe belts of Rennes, 2005.



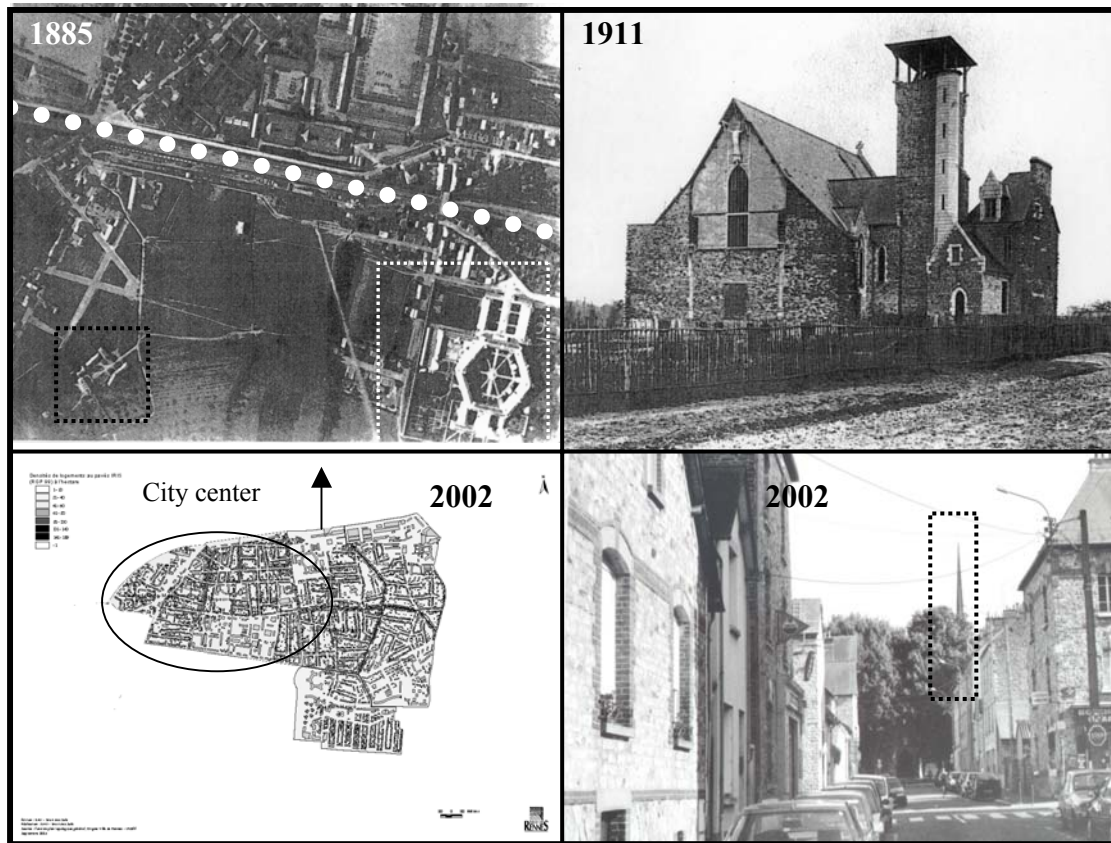
Source : Rennes city GIS data. Conception: author.

Table 1: Physical characteristics of fringe belts

NANTES	Mean plot size (in m²)	Mean building size (in m²)	Mean percentage of building coverage
Inner fringe belt	1076	446	61%
Medium fringe belt	2004	220	37%
Outer fringe belt	3642	362	18%
Neighbouring zone 1	283	185	89%
Neighbouring zone 2	393	79	39%
Neighbouring zone 3	497	71	27%
Whole city	1024	136	38%
RENNES	Mean plot size (in m²)	Mean building size (in m²)	Mean percentage of building coverage
Inner fringe belt	2048	283	92%
medium fringe belt	2969	350	unknown
Outer fringe belt	6954	382	unknown
Neighbouring zone 1	275	203	92%
Neighbouring zone 2	312	62	35%
Neighbouring zone 3	1148	586	61%
Whole city	1233	157	unknown

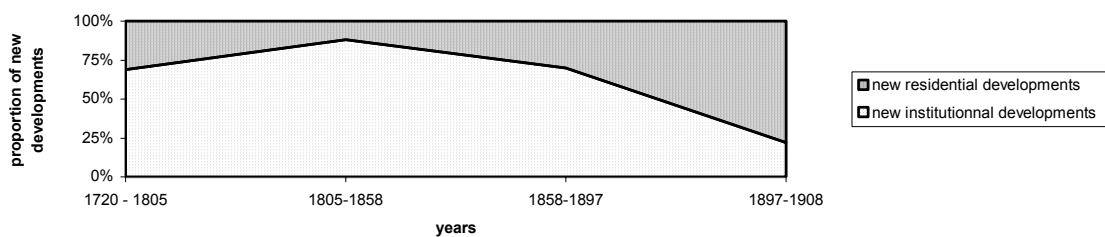
Source : Rennes city GIS data. Conception: author.

Figure 4: Alienated fringe belt, South Rennes



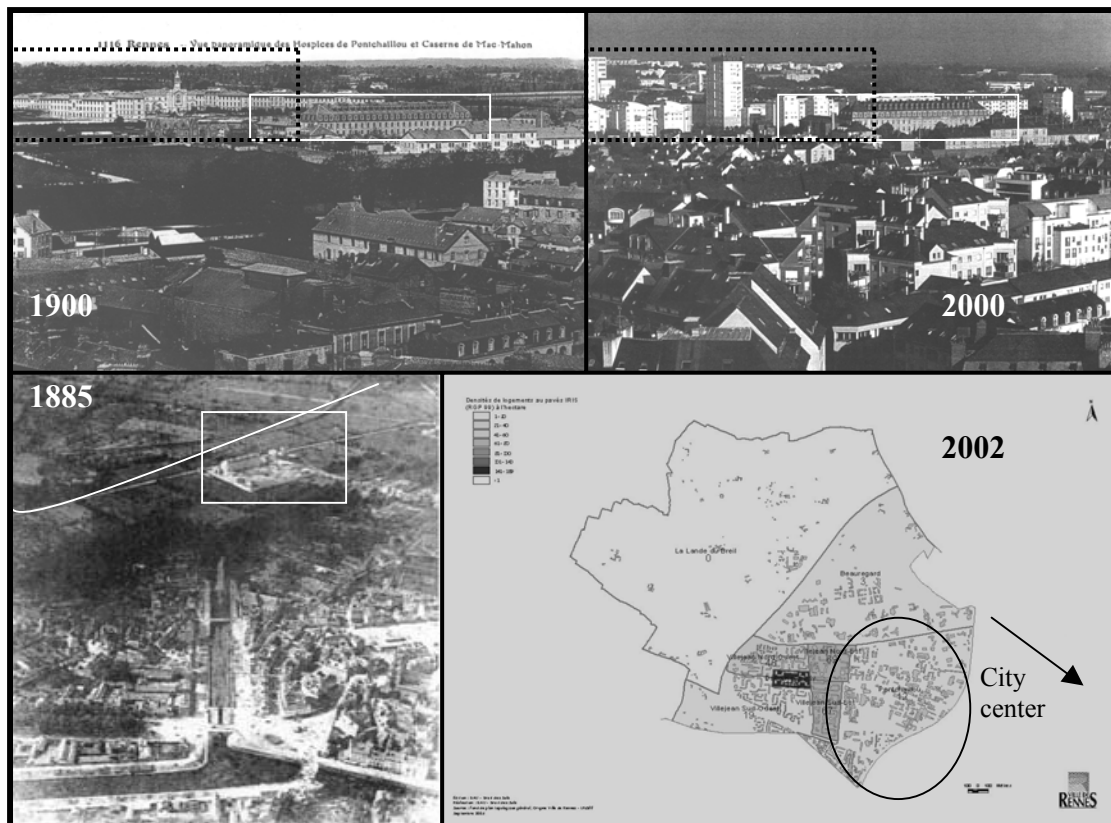
Source: Municipal archives and maps, Rennes City.

Figure 5: Evolution of new urban developments in South Rennes



Source: Municipal archives data, Rennes City. Conception : author.

Figure 6: Partly remaining fringe belt, West Rennes



Source: Municipal archives and maps, Rennes City.

Figure 7: brownfield on the Island of Nantes



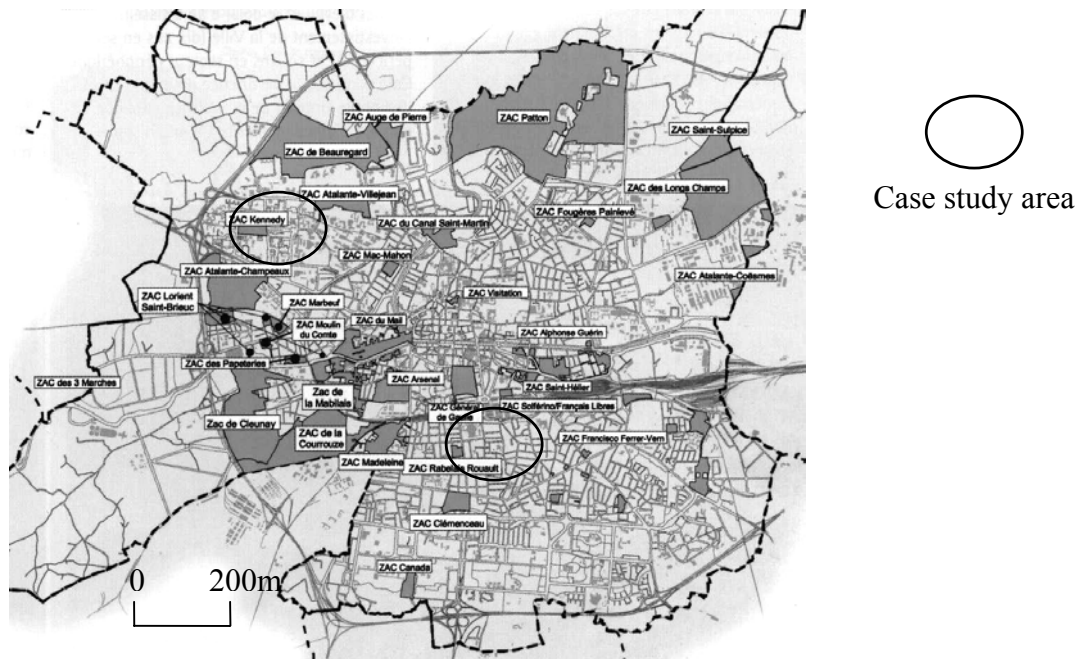
Photo by the author

Figure 8: La visitation (inner fringe belt, Rennes)



Photo by the author

Figure 9: Rennes: “Zones d’Aménagement concertées” in 2004.



Source : Projet urbain 2015, Rennes City Office.